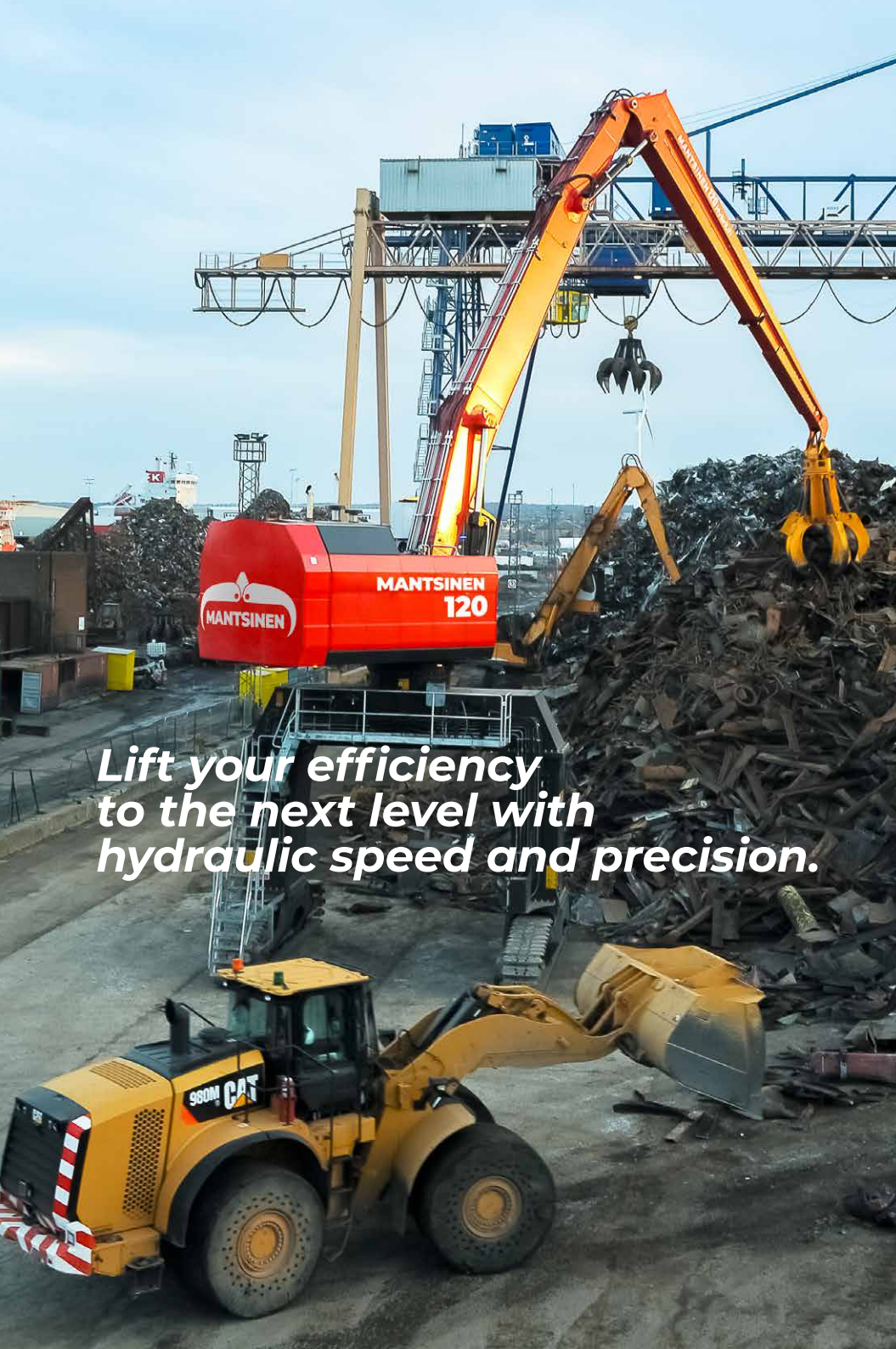




# MANTSINEN 120 HYBRILIFT® POWER AND AGILITY UNITED







*Lift your efficiency  
to the next level with  
hydraulic speed and precision.*

# CONSIDER IT LOADED

Combining precision with efficiency, the Mantsinen multipurpose material handling machines are the perfect solution for various operations in ports and industrial terminals. They are suitable for handling any kind of bulk material, scrap, timber and breakbulk. Equipped with the Mantsinen quick coupling system, working with different attachments is easy, safe and efficient.

With in excess of 50 years experience in logistics services for heavy industry, Mantsinen immediately recognise the demands and challenges for material handling machines in differing operations. The balance of a contractor's mind together with world-class manufacturing

knowledge creates unique solutions for efficient handling operations. With our indepth knowledge, we can optimise your operation and machine configuration.

## **LIFELONG PRODUCTIVITY**

Mantsinen material handling machines are a generational investment, in respect of life and durability. In-house manufacturing of machines and attachments ensures high quality without compromise. All of the critical components are thoroughly Finite Method Analyzed based on strain gauge tests on real operation. Minimum lifetime expectancy is over two million work cycles with maximum loads.

# SUSTAINABLE BY NATURE

For in excess two decades, Mantsinen has paved the way in energy-saving innovations and sustainable solutions. Introduced in 2006, the Mantsinen Hybrilift potential energy storage and recovery system increases energy efficiency, by up to 35 per cent. Hybrilift is a standard feature in all Mantsinen 120 models.

When the main boom is lowered, the potential energy is stored in the Hybrilift accumulators, and again recovered, when lifting the main boom. The Hybrilift system is equivalent up to 125 kW of additional power, it allows using smaller engines that would otherwise be necessary in the process and minimising energy

consumption and emissions. The system includes a temperature compensation, providing full lifting capacity, even when working in cold climates. Also the closed loop swing hydraulics returns kinetic energy back into the system, during swing deceleration. Hydraulic flow is created only on demand, and the thermostat adjusted fans permanently run with optimum speed, thus saving power and keeping noise levels down.

## GET ELECTRIC

The electrically powered machines offer a cost-effective and ecological alternative to diesel powered machines. They provide the same performance level, with zero exhaust emissions, low noise level and



lower energy and maintenance costs. The E-series machines are available with 380 and 690 V supply as standard, and other voltages upon request.

A variety of cable reel solutions are available to meet differing travel demands, with all undercarriage types. An optional diesel-driven Mantsinen power pack allows electric machines to travel independently from the electric supply. IE3 efficiency class motors are started with a soft starter, to keep the start current low. Optional frequency converter start reduces the start current even further. Reactive power compensation system is also available as an option.

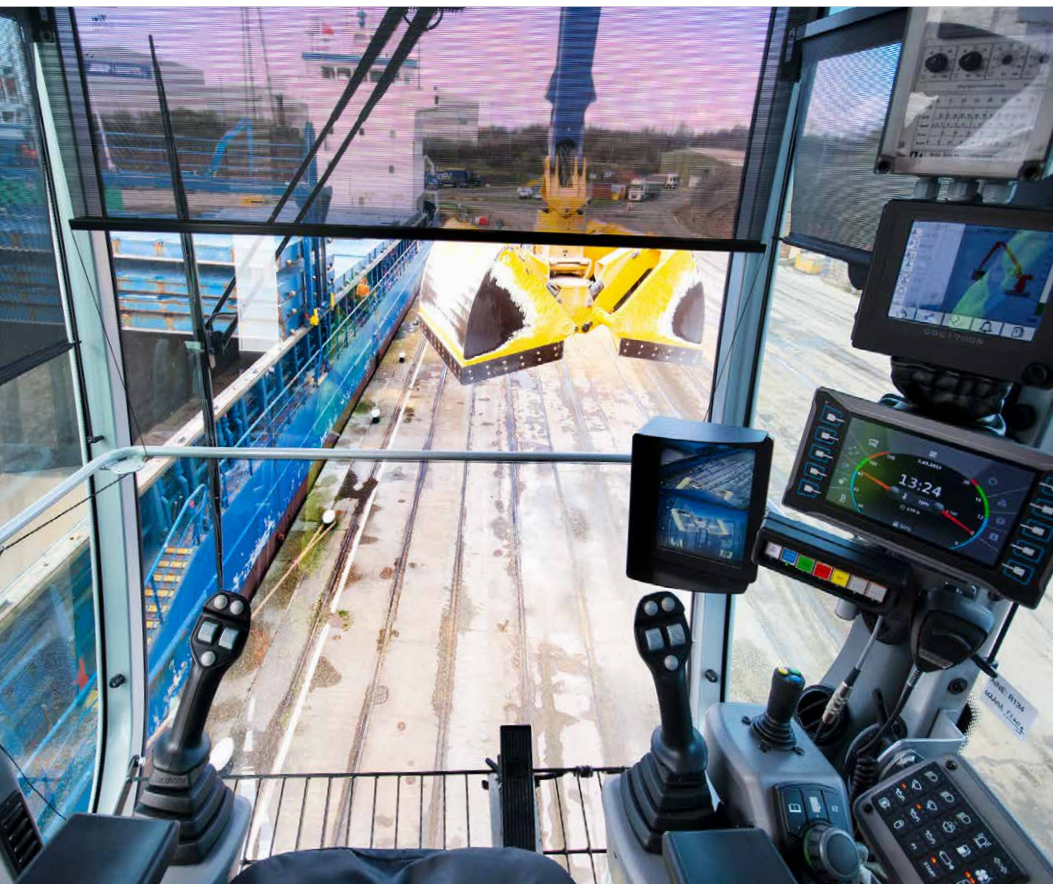
**HYBRILIFT®**

Increases energy  
efficiency by up to

**35%**



# EVERYTHING UNDER CONTROL



## MANTSINEN CONTROL SYSTEM (MCS)

Mantsinen control system is engineered for cost efficient material handling with today's technology. Operator friendly user interface adopts an "Only important is shown" approach easing daily operation, and allows operator to concentrate on the current task. Adjustable multi-function joysticks for front equipment are totally ergonomic and comfortable.

Travel and steering are controlled by a one-grip joystick. Electrically controlled proportional main functions ensures smooth and efficient operating under all conditions.

The system has an electric end cushioning for boom, stick and cab elevator to avoid unpleasant dynamic shocks.

### **HUMAN-MACHINE INTERFACE**

- Graphic user interface 7" display
- Easy to use multifunction control wheel
- Operating data and gauges
- Optional functions state information
- On board and remote diagnostics with detailed error description
- Acoustic signal for critical alarms
- Precision mode and heavy lift mode
- Settings for main functions and options
- Error logging
- Instant power consumption measurement
- Periodic fuel or electric power consumption



# KEEP TRACK OF YOUR OPERATIONS

## MANTSINEN SAFETY SYSTEM (MSS)

Mantsinen machines are equipped with an advanced safety system as standard and the machine operation is all the time under control. There is an overload and stability control function with motion cut-out and various other adjustable safety features included in the system.

- Graphic user interface with 5,7" display
- Animated machine operation
- Load, reach and height information
- Cabin collision prevention
- Attachment menu

## STANDARD IoT – MANTSINEN TELEMATIC SYSTEM (MTS)

With the Mantsinen Telematic System (MTS) users can remotely monitor the operation and productivity of the material handling machine either from a computer or mobile device. Visualisation of the data makes interpretation quick and simple. Automatic scheduled operation reports

can be sent to e-mail or events history can be verified from the cloud service. Transferring the collected data to a terminal or factory IT-systems is possible through a standardized API interface built in to the system.

# DEVELOPED TO GET THE JOB DONE

## UPPER STRUCTURE

The Mantsinen upper structure is specifically designed for fast and hard material handling applications. In-house experience of hundreds of millions of tons of materials and thorough fatigue analysis form the design, functionality and serviceability of the upper structures.

### POWERLINE

Volvo Penta diesel engines are known in material handling industry for their high performance, low fuel consumption and durability. Diesel or electric motor is housed, inside its own housing, is easily accessible from both sides for service. Sound insulated engine and pump compartments keep the noise and vibration level to a minimum. To reduce

fire risk, the pump compartment is isolated from the engine compartment by a firewall.

### HYDRAULICS

The main hydraulics consist of two variable displacement axial piston pumps and a closed loop swing pump. There is a separate circuit for the rotator, cab elevator and optional attachment functions as well as for fans.

Efficient filtration ensures long lifetime for the hydraulic components. Standard three-micron bleed-off fine filter with water absorption ensures continuously clean and dry oil which, increases uptime and extends component and oil lifetime.

Side-by-side mounted hydraulic oil

cooler and radiator are readily accessible for cleaning from the service platform. Fan reversing function cleans the cooler and radiator without interrupting the machine operation.

### RIGID MAIN FRAME WITH SERVICE ROOF

The rigid main frame guarantees a long lifetime to your machine does the three-row slewing ring. The top of the upper structure is equipped with an openable roof for service comfort.

### SERVICE WALKWAYS ALSO INSIDE

The wide inside and outside service walkways satisfy international safety

standards provide unrestricted and safe access to all service points.

### SWING MECHANISM

Mantsinen 120 has a large diameter heavy-duty three row roller type slewing ring with internal teeth running in grease bath. Two heavy planetary swing gears have integrated automatic multi disc brakes and the swing mechanism is operating in a closed loop. Connected with state-of-art electric controls the machine swing is extremely smooth, controllable, saves a considerable amount of energy and provides maximum operator performance.





## FRONT EQUIPMENT

A multitude of options with straight or curved booms and sticks are available to streamline the operation for maximum productivity. Mantsinen boom and stick structures are designed and analysed with modern FEM-methods based on real operation analyses, measurements and long-term practical experience. Minimum life time expectation is over two million work cycles assuming maximum load. Booms and sticks are manufactured in-house under close quality supervision to ensure long lifetime of these structures under extreme fatigue stresses.

### MAIN BOOM

The main boom foot and bosses are constructed of steel castings, providing excellent service life to one of the most critical structural components of the machine. Optimized box structure which

ensures maximum lifetime without compromise. Strong structure and large pin diameters minimize surface pressures and wear on bushings.

### STICK

Stick foot is a cast steel structure. The use of cast structures in the high load stress areas ensures the component's strength, durability and long service life.

The stick box is constructed of four C-profiles using high tensile steel. The design allows the stick to be constructed with no welding seams in high stress areas, making it light and extremely durable. Hydraulic lines are well protected on sides of the stick. As a consequence to the unique stick tip and rotator link design no hoses are exposed from the rotator link or attachment assemblies..

## UNDERCARRIAGES

Robust and proven undercarriage version for every demand and conditions. Stability and robustness are the key features in all the Mantsinen undercarriages. All the machines are able to operate 360° sector with full load.

Undercarriages are available in several different heights to optimise the

operation, reach and visibility. Mantsinen organization provides with support load information and operational drawings on a case by case and individually tailored basis.

More detailed information on the undercarriages from the product pages.

# STRENGTH IS NOTHING WITHOUT VISION

## STAINLESS STEEL CABIN

The spacious and modern operator cabin has an excellent visibility with a large windscreen and floor window in one curved piece. The cabin is made of stainless steel for long lifetime even in the most demanding or corrosive working environments. The cabin is also FOPS tested. Sound insulation, low vibration and high quality interiors create the most comfortable environment for the operator.

The automatic powerful heating and air conditioning, tinted glasses and adjustable sun shades make the cabin comfortable in all weather conditions. Windshield wiper has two speeds, an adjustable intermittent function and a washer. There is a separate wiper for the skylight.

The operator works in an ergonomically designed environment. All joysticks, control panels and user interface displays can be easily controlled and operated. In case of emergency the cabin can be quickly and safely evacuated by using a harness.

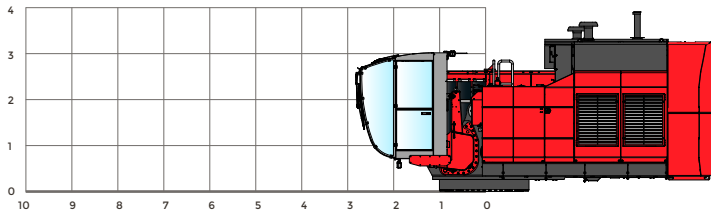
	STANDARD	OPTION
<b>EQUIPMENT FOR CABIN AND OPERATOR SEAT</b>		
Windshield and floor window in one place	•	
Roof Window	•	
Tinted window glasses	•	
Automatic heating and air conditioning	•	
First aid kit	•	
Sun shades	•	
Folding instructor seat	•	
Bluetooth CD/USB, MP3/WMA receiver	•	
Cup holder	•	
Literature compartment	•	
Two 12 V plugs for chargers	•	
240 VAC plugs are standard in electric versions and optional in diesel machines	•	
Emergency exit harness	•	
Standard seat	•	
- Air suspension	•	
- Automatic weight adjustment	•	
- Swivel function	•	
- Seat belt	•	
- Heating	•	
- Fully adjustable; slide, front back, height, seat tilt, armrests, headrest, back rest	•	
Windshield with heating	•	
Seat Be-Ge with airvent		•
Cabin protection guards		•
Bullet proof 22 mm thick windscreen (BR4NS) with separate floor window		•
Integrated CAN-BUS anemometer with adjustable alarms		•
Stick or rear view camera with 7" display or several cameras with 12" shared display		•
Shortwave radio and customer IT-system readiness		•
Loudspeaker, activation with pedal		•
Alcolock system with SMS function		•



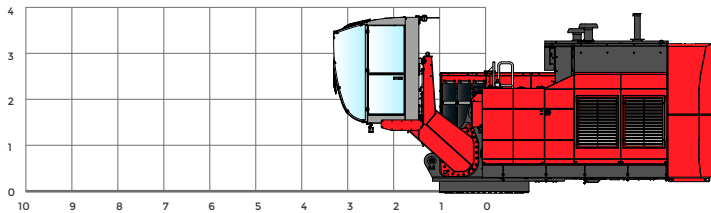
# CABIN OPTIONS

Mantsinen 120 Hybrilift® has three fixed cab positions.

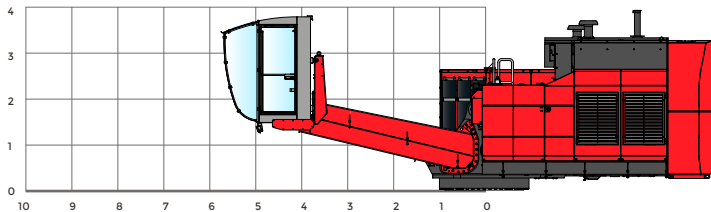
**FIXED CAB POSITION 1.**



**FIXED CAB POSITION 2.**



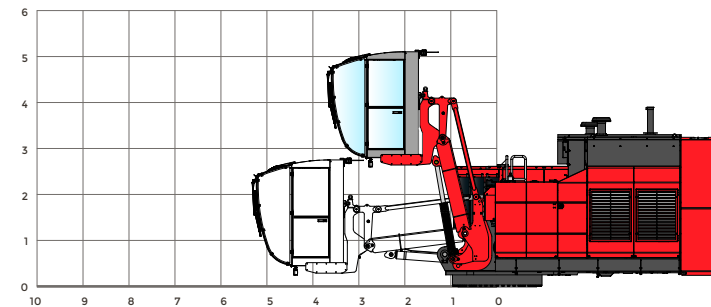
**FIXED CAB POSITION 3.**



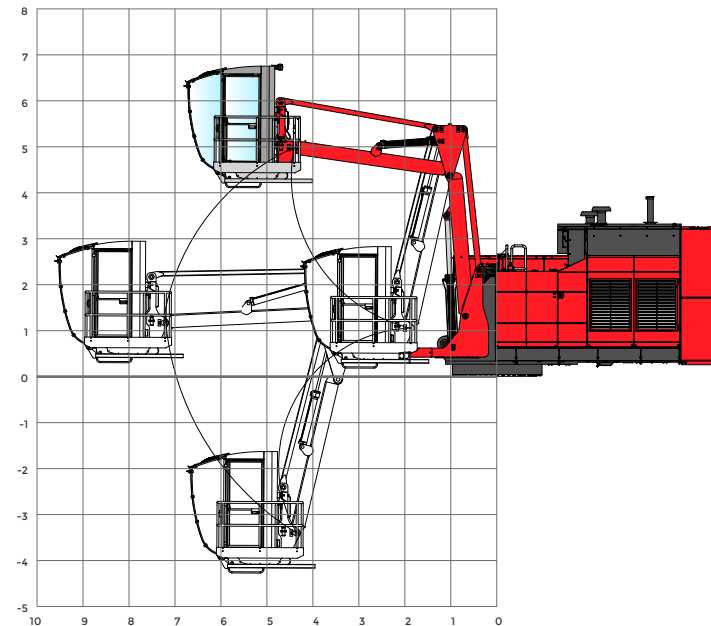
# CABIN ELEVATORS

Mantsinen 120 Hybrilift® has two cab elevator options. Robust Mantsinen N2-5000 cab elevator features independent vertical and horizontal movement to position the operator for maximum visibility of loading targets. One arm cab elevator N1-3000, simply brings operator high up.

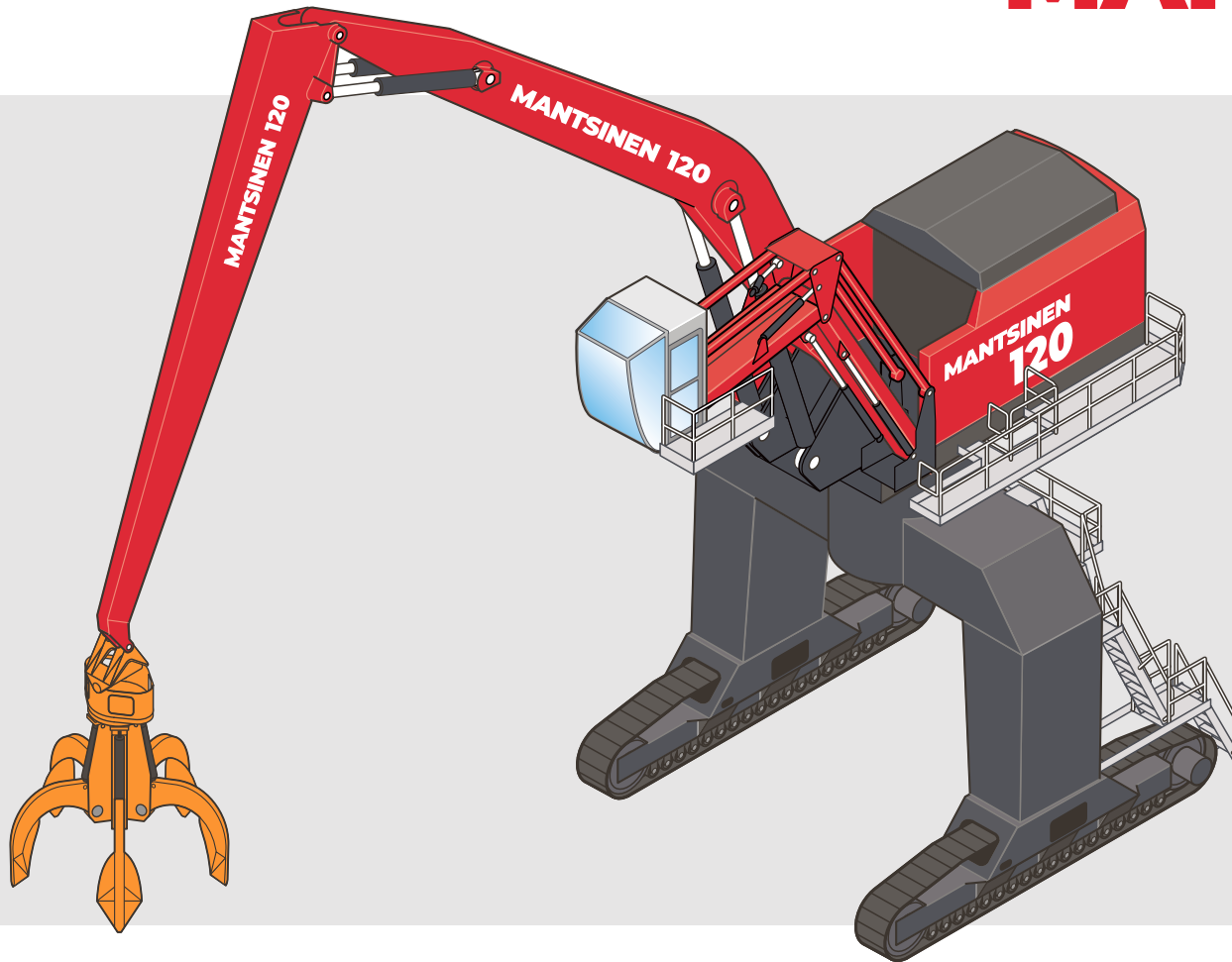
**N1-3000**



**N2-5000**



# MANTSINEN 120R



## CRAWLER GANTRY

Crawler gantry allows significant benefits for and effective logistic layout design. The gantry style undercarriage allows trucks or rail cars to pass through. Additionally the machine cycle time and truck waiting times are minimised due to the optimised swing angle. One or two additional fuel tanks within the gantry leg structure are available as an option.

## CRAWLER TRACKS

Long and wide apart tracks create an excellent stability foundation for the machine. The Mantsinen designed flat track shoes run smoothly on gravel, asphalt or concrete. Special Heavy Duty or extended tracks are available for extreme conditions.

## CRAWLERS

120ER sidemounted



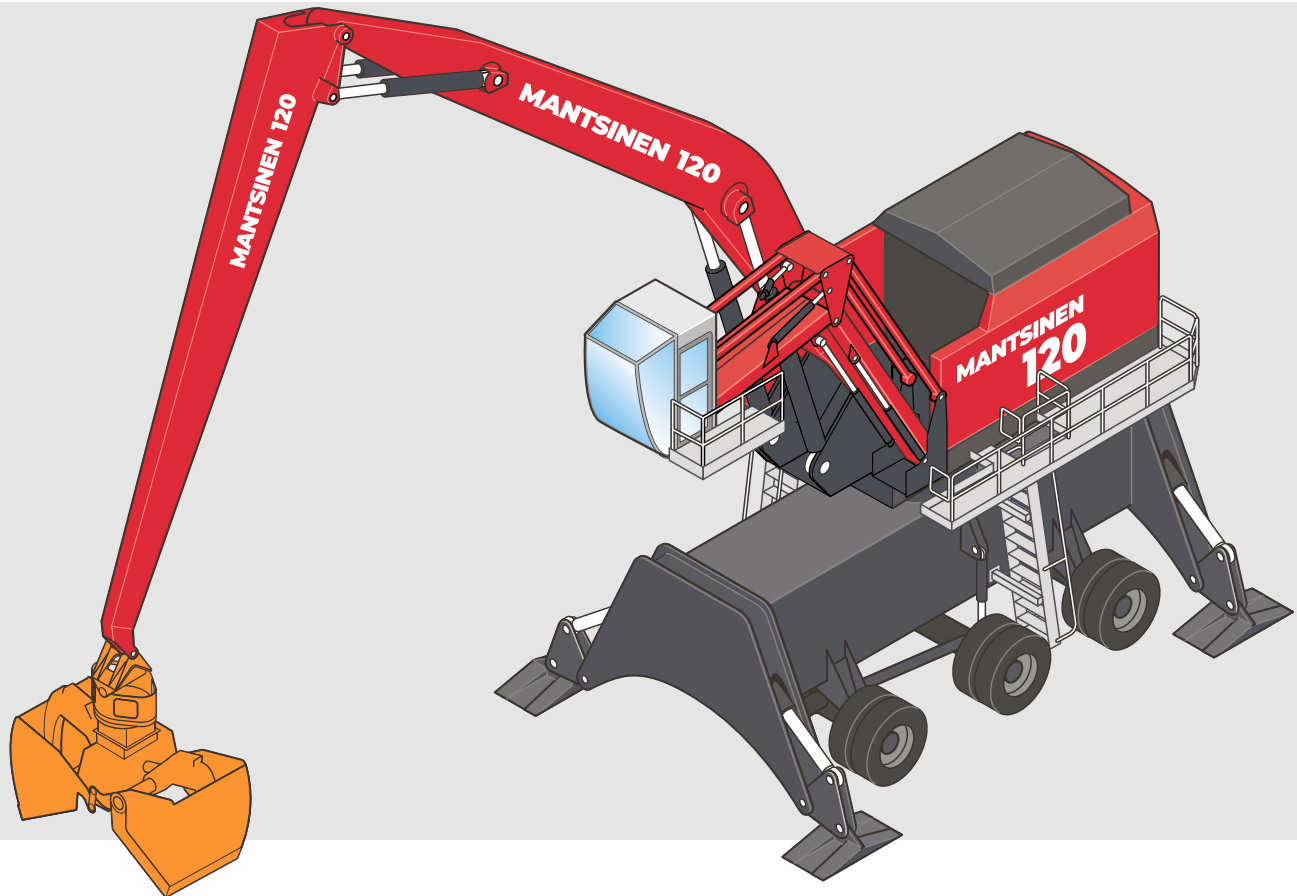


# MANTSINEN 120M

## RUBBER TYRE

The three axel rubber tyre undercarriage provides great mobility in this machine size class with reduced axel loads. The four-wheel drive and steering provides a good drawbar pull and facilitates operation on uneven surfaces.

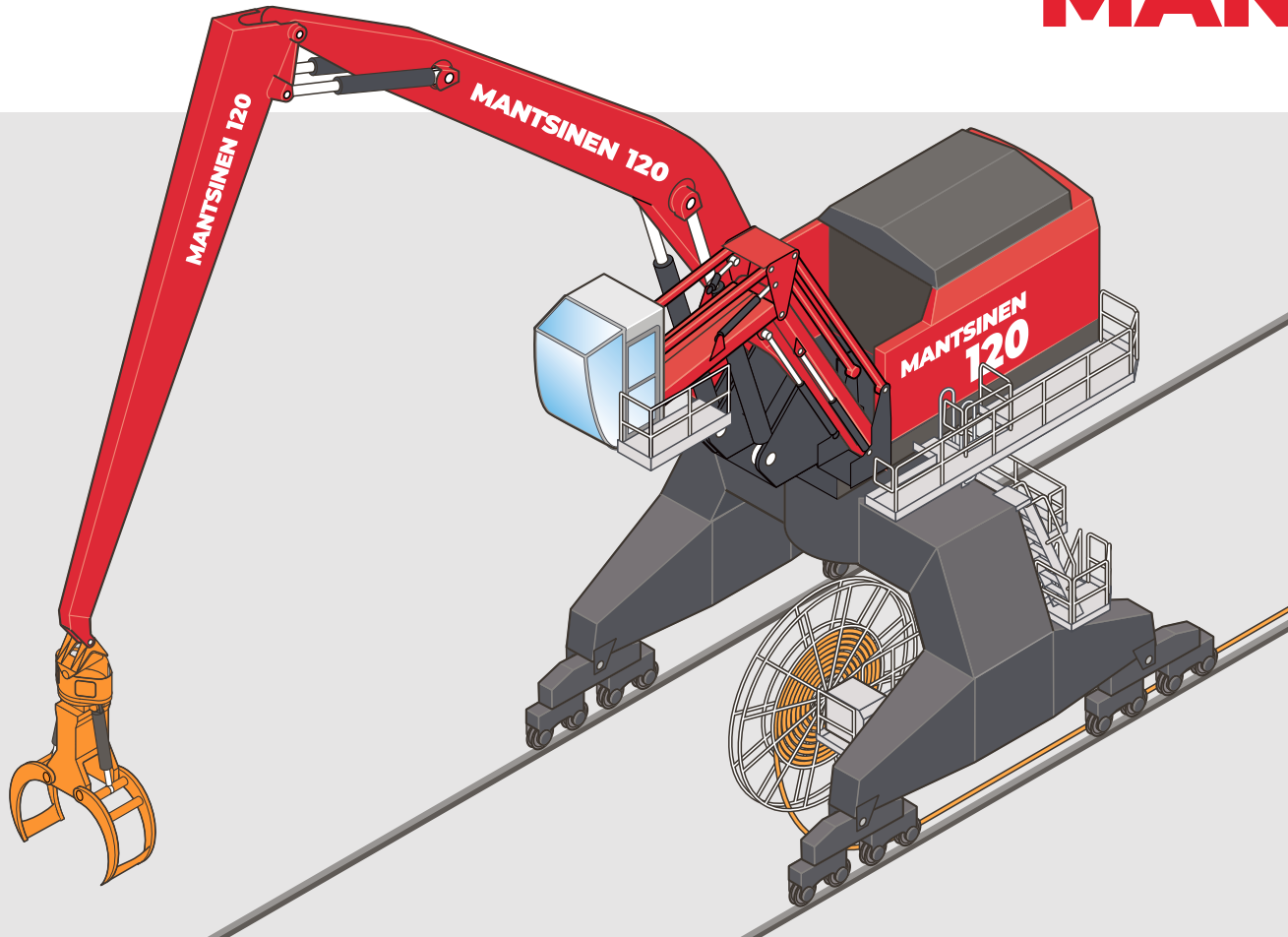
Four individually controllable outriggers permit a full 360° lifting sector with rated loads on firm and even underfoot conditions. Standard 950 × 1500 mm stabilizer pads are equipped with spherical bearings to adapt to the ground and to reduce ground pressure. Optional 1350 × 1500 mm pads available to reduce ground pressure even more.



## RUBBER TYRE GANTRY

Rubber tyre gantry undercarriage combines the benefits for both logistic layout design as well as mobility. Gantry type undercarriage allows trucks or rail cars to pass through. Also cycle time can be minimized due to the optimised swing angle.

# MANTSINEN 120S



## RAIL MOUNTED

Rail undercarriage can be tailored around existing rails. Both the wheel diameter and number of wheels can be optimised to match permissible rail loads. There are 400 mm and 630 mm wheel options available for different rail profiles. Hydraulic planetary wheel drives provide smooth travel and keep the machine steady throughout operation. The machine can be easily adapted to pull a hopper on rails. Rail cleaners, buffers and storm clamp are all available as options. Depending on gantry width the undercarriage allows one or more rail wagons to pass through. Both diesel and electric versions are available for a rail mounted machine.

## FIXED

Fixed undercarriage can be optimised using differing gantrys or pylons. The machine, equipped with diesel engine or electric motor, and can be adapted to existing quay or pontoon.





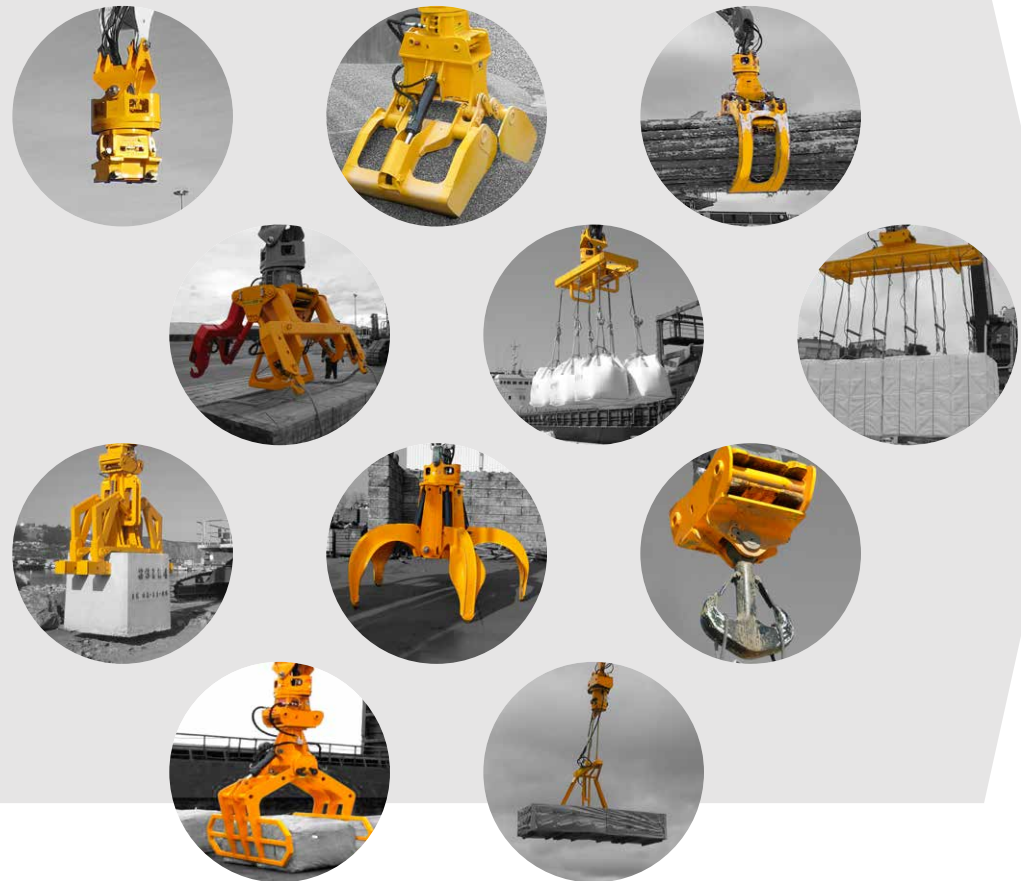
# MAXIMUM PRODUCTIVITY

## QUICK COUPLERS & ATTACHMENTS

Mantsinen offers a wide variety of attachments to optimise production for every operation. Semi-automatic attachments for example for big bags, pallets, and lumber bundles ensure an efficient and safe operation. Fully automatic attachments for example for handling pipes or pulp bales maximise production with minimal labour. Customised attachments are available on request.

Attachments can be equipped with a fixed rotator or with a separate quick coupling system. In both cases the hydraulic hoses from the machine to the attachment are routed directly through the rotator link. The rotator swivel can be equipped with two to six hydraulic lines and optionally with an electric slip ring column.

The Mantsinen hydraulic quick coupling enables fast and safe attachment changes. It only takes a few minutes to swap from one attachment to another.



# TECHNICAL SPECIFICATIONS

FRONT EQUIPMENT	
Max. horizontal reach	27,4 m with 15,0 m main boom and 13,0 m stick
Main boom lengths, straight and curved	10,0 / 11,0 / 12,0 / 13,0 / 14,0 / 15,0 m
Stick lengths	8,0 / 9,0 / 10,0 / 11,0 / 12,0 / 13,0 m
DIESEL ENGINE	
Engine type	Volvo TAD1384VE 375kW, Stage V
Power	375 kW / 1 800 rpm
Displacement	12,8 l
Number of cylinders	6
Electric system	24 VDC, alternator 150 A / 24 V, batteries 2 × 225 Ah / 12V
ELECTRIC MOTOR	
Motor type	250 kW IEC cast iron frame squirrel cage motor, 1500 rpm / 50 Hz
Voltages	380 to 690 V as standard, other voltages upon request
HYDRAULIC SYSTEM	
HybriLift® energy recovery system	Equivalent to 124 kW engine power
Oil flow, front equipment and travel	2 × 420 l/min
Operating pressure, front equipment	330 bar
Operating pressure, travel and Heavy Lift mode	350 bar
Oil flow, swing	395 l/min, closed loop system
Operating pressure, swing	270 bar
Max swing speed	6,0 r/min
Swing torque	240 kNm

Specifications subject to change without prior notice. The photographs and/or drawings in this brochure are for illustrative purposes only. Refer to the Operator's Manual for instructions on the proper use of this equipment.

120R / 120ER, CRAWLER UNDERCARRIAGE	
Weight without attachments	110 to 135 t, depending on configuration
Standard undercarriage height	2,5 m, with pylon 4,0 / 4,7 / 5,2 m
Gantry undercarriage height	6,5 / 7,0 / 8,0 m with gantry and with pylon 8,0 / 8,7 m
Track shoes	850 mm cast flat, 670 mm flat welded, 850 mm flat welded
Travel speed	Max 3,5 km/h
120 M / 120 EM, RUBBER TYRE UNDERCARRIAGE	
Weight without attachments	125 to 140 t, depending on configuration
Standard undercarriage height	3,0 m with pylon 4,5 / 5,2 / 5,7 m
Wheelbase	2 × 2 800 mm
Wheel gauge	4 145 mm
Tyres	12 × 14,00-25 solid rubber
Service brakes	Wet multiple disc brakes on two axles
Parking brakes	Automatic wet multiple-disc parking brakes on two axles
Drive speed	Max 5 km/h
Stabilizer pads	950 × 1 500 mm, with spherical bearings, optional pads 1350 × 1500 mm
120M / 120EM, RUBBER TYRE GANTRY	
Undercarriage height	6,5 / 7,0 / 8,0 / 8,7 m with pylon
120S / 120ES, RAIL UNDERCARRIAGE	
According to customer specification	
120F / 120EF, FIXED UNDERCARRIAGE	
According to customer specification	
REFILL CAPACITIES	
Hydraulic oil	1 000 l net volume
Fuel tank	1 500 l
Engine oil	40 l
AdBlue tank	160 l



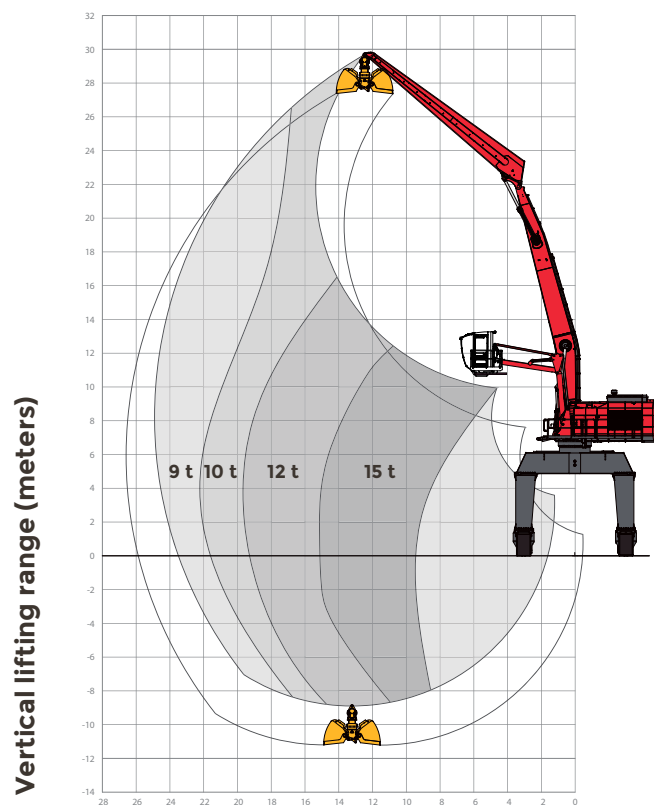
# REACH FOR PRODUCTIVITY

## MANTSINEN 120 HYBRILIFT®

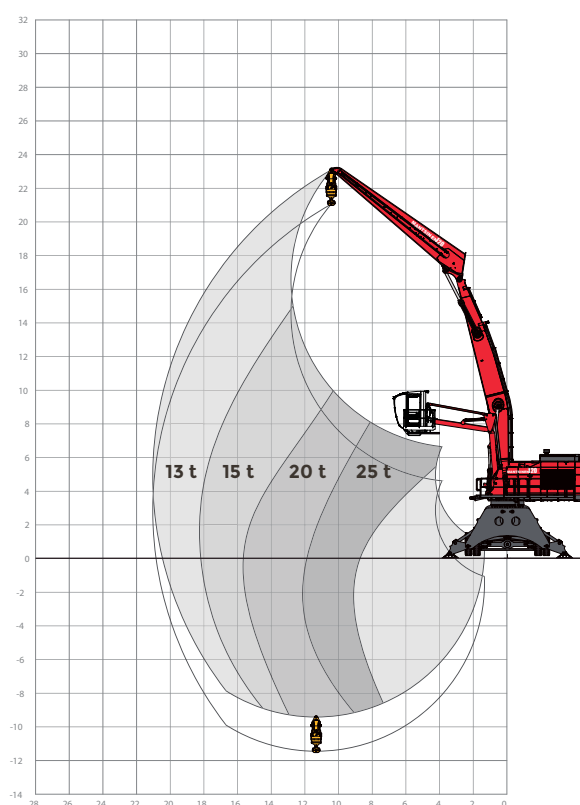
Contact your Mantsinen representative ([www.mantsinen.com/en/sales/](http://www.mantsinen.com/en/sales/)) for specific load diagrams for your operation.

### Horizontal lifting range (meters)

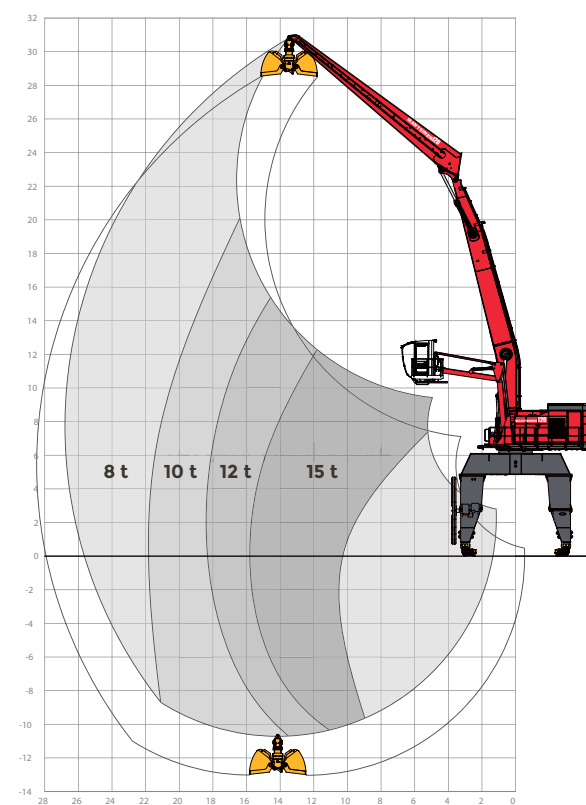
Lifting capacity range with 14 m curved main boom and 12 m stick



Lifting capacity range with 12 m curved main boom and 10 m stick



Lifting capacity range with 15 m curved main boom and 13 m stick





## THE STRONGEST LINK IN THE GLOBAL LOGISTICS CHAIN

Mantsinen provides more efficiency, speed and capacity for our customers in global logistics chain, operating with heavy and basic industry raw materials and semi-finished products. We are the hands-on frontrunner in material handling.

## MANTSINEN GROUP LTD OY

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